

CLAIMS

We claim:

1 1. An antenna for RF communications comprising:
2 a radiating member comprising an electrically conductive material and having a
3 slot extending from a first portion of said radiating member to a second portion of said
4 radiating member, said radiating member being substantially tubular and defining a
5 cavity therein;
6 an impedance matching device electrically connected to said radiating member,
7 said impedance matching device disposed to match an impedance of said radiating
8 member with at least one of an impedance of a signal source and an impedance of a
9 load; and
10 a conductor operatively connecting said radiating member to said impedance
11 matching device;
12 wherein said impedance matching device, said conductor, and at least a portion
13 of said radiating member are integrally formed from a single conductive sheet.

1 2. The antenna of claim 1, wherein said non-conductive slot extends along a length
2 of said radiating member.

1 3. The antenna of claim 1, wherein said radiating member and said impedance
2 matching device have a common cross sectional profile.

1 4. The antenna of claim 1, further comprising at least one capacitor comprising at
2 least a first conductive lead and a second conductive lead, said first conductive lead
3 being connected to said radiating member proximate to a first side of said non-
4 conductive slot, and said second conductive lead being connected to said radiating
5 member proximate to a second side of said non-conductive slot.

1 5. The antenna of claim 4, wherein said at least one capacitor is a variable
2 capacitor.

1 6. The antenna of claim 1, wherein said impedance matching device is connected
2 to said second portion of said radiating member.

1 7. The antenna of claim 1, wherein said impedance matching device comprises a
2 transverse electromagnetic feed coupler.

1 8. The antenna of claim 1, wherein the field impedance of said antenna is less than
2 about $0 \pm 2j$ ohms.

1 9. The antenna of claim 1, wherein the absolute value of the field impedance of said
2 antenna is less than 5 ohms.

1 10. An antenna for RF communications comprising:
2 a radiating member comprising an electrically conductive material, said radiating
3 member being substantially tubular and defining a cavity therein;
4 a non-conductive slot extending from a first portion of said radiating member to a
5 second portion of said radiating member; and
6 an impedance matching device electrically connected to said radiating member,
7 said impedance matching device disposed to match an impedance of said radiating
8 member with at least one of an impedance of a signal source and an impedance of a
9 load;
10 wherein the absolute value of the field impedance associated with said antenna
11 is substantially less than 50 ohms.

1 11. The antenna of claim 10, wherein the field impedance of said antenna is less
2 than about $0 \pm 2j$ ohms.

1 12. The antenna of claim 10, wherein the absolute value of the field impedance of
2 said antenna is less than 5 ohms.

1 13. The antenna of claim 10, further comprising at least one capacitor comprising at
2 least a first conductive lead and a second conductive lead, said first conductive lead
3 being connected to said radiating member proximate to a first side of said non-
4 conductive slot, and said second conductive lead being connected to said radiating
5 member proximate to a second side of said non-conductive slot.

1 14. The antenna of claim 13, wherein said at least one capacitor is a variable
2 capacitor.

1 15. The antenna of claim 10, wherein said impedance matching device is connected
2 to said second portion of said radiating member.

1 16. The antenna of claim 10, wherein said impedance matching device comprises a
2 transverse electromagnetic (TEM) feed coupler.

1 17. An antenna for RF communications comprising:
2 a radiating member comprising an electrically conductive material, said radiating
3 member being substantially tubular and defining a cavity therein;
4 a non-conductive slot extending from a first portion of said radiating member to a
5 second portion of said radiating member;
6 an impedance matching device electrically connected to said radiating member,
7 said impedance matching device disposed to match an impedance of said radiating
8 member with at least one of an impedance of a signal source and an impedance of a
9 load; and
10 a conductor operatively connecting said radiating member to said impedance
11 matching device;
12 wherein said impedance matching device, said conductor, and at least a portion
13 of said radiating member are integrally formed from a single conductive structure.

1 18. The antenna of claim 17, wherein said single conductive structure is formed by at
2 least one of a casting process and an extrusion process.

1 19. The antenna of claim 17, wherein said non-conductive slot extends along a
2 length of said radiating member.

1 20. The antenna of claim 17, wherein said radiating member and said impedance
2 matching device have a common cross sectional profile.

1 21. The antenna of claim 1, further comprising an electrostatic shield member, said
2 electrostatic shield member having an axial slot extending from a first end of said
3 electrostatic shield member to a second end of said electrostatic shield member.

1 22. The antenna of claim 1, wherein said antenna is arranged to produce a cardioid
2 radiation pattern, said cardioid radiation pattern having a general form of $(1-\cos^2 \theta)$.

1 23. An antenna for a mobile RF communications device comprising a radiation
2 element arranged to produce a cardioid radiation pattern, said cardioid radiation pattern
3 having a general form of $(1-\cos^2 \theta)$.